CLAIMS:

1. An MR device for MR imaging, which device includes:

- a main field magnet for generating a steady main magnetic field;
- a gradient coil system with a plurality of gradient coils for generating magnetic gradient fields;
- an RF coil system for transmitting and/or receiving RF signals, which coil system includes at least two RF coil arrays which are integrated in one coil former and have been optimized for different applications, each RF coil array comprising at least two RF coils decoupled from one another;
- a transmit/receive unit for driving the RF coil arrays and for receiving MR signals from the RF coil arrays, there being provided a plurality of channels, notably a number of channels which corresponds to the number of RF coils of the RF coil array comprising the largest number of RF coils;
- a control unit for controlling the MR imaging, the control unit being arranged to switch over the RF coil arrays for temporally separate use of the individual RF coil arrays during the MR data acquisition; and
- a processing unit for processing received MR signals.

2. An MR device as claimed in claim 1, characterized in that the at least two RF coil arrays are decoupled from one another.

3. An MR device as claimed in claim 1, characterized in that a first RF coil array has been optimized for the SENSE method or the SMASH method and a second RF coil array has been optimized as a synergy coil array.

4. An MR device as claimed in claim 3, characterized in that the RF coils of the SENSE RF coil array or the SMASH RF coil array are arranged in the coil former in such a manner that they are situated nearer to the object to be examined than the RF coils of the synergy coil array.

5. An MR device as claimed in claim 3, characterized in that the SENSE RF coil array or the SMASH RF coil array comprises more and smaller RF coils than the synergy coil array.

6. An MR device as claimed in claim 3, characterized in that the RF coils of the synergy coil array are arranged so as to overlap one another and that the RF coils of the SENSE RF coil array or the SMASH RF coil array are arranged so that they do not overlap one another.

7. An MR device as claimed in claim 1, characterized in that all RF coils are connected to a separate channel of the transmit/receive unit and that the control unit is arranged for the simultaneous acquisition of MR signals by means of RF coils of different RF coil arrays.

8. An MR device as claimed in claim 7, characterized in that there provided means for feeding back MR signals acquired and evaluated in real time to the control unit so as to change the control of the instantaneous MR data acquisition in conformity with the MR signals acquired and evaluated in real time.

9. An MR device as claimed in claim 7, characterized in that the control unit is arranged to acquire MR signals from a first sub-region of the k space by means of a first RF coil array, notably for the acquisition of MR signals from the central region of the k space by means of a synergy coil array, and to acquire MR signals from a second sub-region of the k space by means of a second RF coil array, notably for the acquisition of MR signals from edge regions of the k space by means of a SENSE RF coil array or a SMASH RF coil array.

10. An RF coil system for an MR device as claimed in claim 1 for the transmission and/or reception of RF signals, comprising at least two RF coil arrays which are integrated in one coil former and have been optimized for different applications, each RF coil array comprising at least two RF coils which are decoupled from one another.